

BIRDS IN FOUR REMNANT BUSHLAND ISOLATES AND A GARDEN AND THEIR IMPORTANCE TO LARGE ISOLATED RESERVES IN PERTH

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ABSTRACT

The birds of four small, isolated remnant urban bushlands: – Shenton Bushland (21 ha), Underwood Avenue Bushland (31 ha), Hollywood Reserve (6.5 ha), a small unnamed bushland isolate on Monash Avenue (0.75 ha), and a nearby garden (0.1 ha) in metropolitan Perth are recorded. These four remnants are situated between two of Perth's major bushlands – Kings Park (approximately 267 ha of bushland) and Bold Park (approximately 400 ha of bushland). A total of 46 native bird species was recorded. Nearly half of these species are likely to be dependent upon native bushland, highlighting the importance of urban bushland fragments for the preservation of regional avian biodiversity. In addition, it is likely that many species use the smaller bushlands to disperse between Kings Park and Bold Park. These small bushland fragments may play a key role in maintaining species diversity in the larger iconic bushland reserves.

INTRODUCTION

There are numerous studies on the effects of habitat fragmentation on bird communities and the important role of remnant vegetation in facilitating dispersal between fragments (e.g. Kitchener *et al.* 1982; Saunders and Curry 1990; Saunders and de Rebeira 1991; Ford *et al.* 1995; Miller and Cale 2000; Major *et al.* 2001; Watson *et al.* 2003; Antos

and White 2004). While, several studies have documented the birds inhabiting major urban bushland fragments in the Perth metropolitan area (Bold Park, How and Dell 1990; Kings Park, Serventy 1938, Recher 2004), no long-term datasets have been published on the birds inhabiting smaller urban bushland fragments. In this study we list the birds of four urban bushland

remnants and a nearby garden in metropolitan Perth, none of which is more than 900m from its nearest neighbour (Berry and Berry 2008). These remnants are Shenton Bushland (21 ha), an A Class Reserve, sampled over 11 consecutive years between 1994 and 2005. Underwood Avenue Bushland (31 ha), owned by the University of Western Australia, sampled over two years – 1998/1999 and 2000/2001, Hollywood Bushland (6.5 ha), a C Class Reserve sampled in 2001/2002, and a small, unnamed isolate on Monash Avenue (0.75 ha), referred to as the Hospital Bushland, sampled in 2001/2002. The garden in Burwood St. (0.1 ha) was monitored from 1981 to 2007. The four remnants and the garden are situated between two of Perth's major bushlands – Kings Park (approximately 267 ha of bushland) and Bold Park (approximately 400 ha of bushland). As well as providing a record of avifaunal diversity at these sites, our aim was to identify species likely to be reliant on native bushland to maintain a presence in the metropolitan area.

METHODS

For a general account of soils, vegetation, fire history, location of sampling locations and vesting/ownership of the four bushlands see Berry and Berry (2008).

Birds were mainly recorded while doing daily checks of pit-traps

set for ground vertebrates. This involved walking the same route along and between pit-trap lines soon after dawn between the months of September to March and recording taxa within sight or hearing distance. No attempt was made to count individuals. At Shenton Bushland, the total number of days sampled over the 11 year span was 1,230. At Underwood Avenue Bushland, sampling was continuous from 17 October 1998 to 14 March 1999 (149 days) and 10 September 2000 to 25 February 2001 (155 days). At Hollywood Reserve, sampling was undertaken between 16 September 2001 and 29 February 2002 (123 days). At Monash Avenue Bushland, sampling was undertaken between 16 September 2001 and 29 February 2002 (123 days). The bird fauna of the garden was recorded opportunistically between 1981 and 2007 (26 years). No attempt was made to quantify bird abundance. In addition, birds were opportunistically recorded in the bushlands on other visits that usually ranged more widely than the transects. Birds flying overhead were not included, apart from Welcome Swallows and Tree Martins.

RESULTS

A total of 50 species was recorded in this study, including 46 native species. These species, together with lists of birds recorded from Kings Park by Serventy between 1928 and 1937 (Serventy 1938) and

by Recher between 1996 and 2002 (Recher 2004), and at Bold Park by Dell (How and Dell 1990) and Birds Australia (1975–2004) are listed in Table 1. (Bird lists for Kings Park include additional taxa not recorded from Serventy and Recher's transects).

Fifty bird species were recorded in Shenton Bushland (26 non-passerine and 24 passerine); 40 species were recorded in Underwood Avenue Bushland (19 non-passerine and 21 passerine); 31 species were recorded at Hollywood Reserve (14 non-passerine and 17 passerine); 15 species were recorded at Monash Avenue Bushland (6 non-passerines and 9 passerine) and 36 species (18 non-passerines and 18 passerine) from the Nedlands garden. Twenty-three (46%) of the taxa recorded at Shenton and Underwood Avenue Bushlands are likely to be dependent on native bushland to maintain a presence or breed in the metropolitan area, and 14 species are represented on the list of "significant birds" of the Swan Coastal Plain in 'Bush Forever' (Government of Western Australia 2000). Notable among these is the Little Eagle, breeding in Underwood Avenue Bushland, and Carnaby's Cockatoo. There is evidence of recent recolonisation of Shenton Bushland with the first records there after a decade of the Variegated Fairy-wren and the Common Bronzewing Pigeon.

DISCUSSION

Serventy (1938) noted that at the

time of his first Kings Park bird census between 1928 and 1937, the habitat of Kings Park had already been altered by removal of large trees and clearing, and that this was ongoing, despite its A Class Reserve status. He also noted Kings Park's increasing isolation: "The Park is bounded by the Swan River estuary on the eastern side and houses shut it in along all other boundaries, except for just over a mile on the west where it is continuous with cut-over bush extending across the Perth-Fremantle railway line to the coast". The four discontinuous bushlands which are the subject of this study are all that now remains of this "cut-over bush" connection between Kings Park and the Coast (now represented by Bold Park bushland which has a tenuous connection, particularly to the north in the form of the foreshore reserve).

The Bold Park bird list of How and Dell (1990) and Recher's most contemporary list and review of the status of Kings Park birds (Recher 2004) are included in Table 1. From this it is possible to consider the extent to which Underwood Avenue, Shenton, Hollywood Reserve, and Monash Avenue bushlands are used as "stepping-stones", or potentially may be used, to maintain the native bird assemblage of Kings Park, or even enhance it, should its habitat be restored to a more original state.

Recher (1997) attributes the decline and local extinction of

bird species to change in composition and structure of the Park's native vegetation (particularly loss of the native eucalypt canopy), change in the fire regime, habitat loss on the Swan Coastal Plain and increased isolation. The bushland bird fauna recorded at Bold Park by How and Dell (1990) with 62 taxa, is most representative of the original fauna of the Swan Coastal Plain (see Serventy 1948; How and Dell 1993) with at least seven species still present that had apparently already become extinct in Kings Park by 1928 when Serventy did his first census, or which have subsequently become locally extinct there (Red-capped Parrot, Splendid Fairy-wren, White-browed Scrubwren, Grey Shrike Thrush, Brown-headed Honeyeater, White-naped Honeyeater, Tawny-crowned Honeyeater). Bold Park is therefore a potential source of recolonisation by such species to Kings Park. More importantly, it is also the most likely source of recruitment that may currently enable elements of the present bird assemblage of Kings Park to persist.

Table 1 identifies 34 species that we consider to be reliant on bushlands to maintain a presence or to breed in the metropolitan area. (Mountain and Wood Ducks are included in this list because, although common waterbirds, both were recorded breeding in bushlands and are probably largely dependant on hollows in native vegetation to

breed in the metropolitan area). Twenty-one (62 %) of these bush-dependant birds were recorded in Kings Park, Bold Park, Shenton Bushland and Underwood Avenue Bushland. While some of these, such as the Common Bronzewing Pigeon, Purple-crowned Lorikeet and Red-capped Parrot may be potentially capable of reaching Kings Park without access to "stepping stones" of native bushland, their apparently transient presence in Shenton and/or Underwood Bushlands suggests that these bushlands are not large enough to sustain populations. It is likely that others, such as the Rufous Whistler, Grey Fantail, Western Flyeater, Weebill, Yellow-rumped Thornbill, and Black-capped Sittella may be entirely dependant on these intermediate bushlands to reach Kings Park where the status of all these passerines, except the Weebill and Rufous Whistler, is reported to currently be declining (Recher 2004). The Grey Fantail and Painted Button-quail are examples of highly mobile species which require native bushlands to breed in the metropolitan area.

The first recording in a decade at Shenton Bushland of the Variegated Fairy-wren in 2002 and Common Bronzewing Pigeon in 2003 provides evidence of the dynamic nature of bird populations and the potential use of native bushland in recolonization within the metropolitan area. Neither of these species is recorded from Bold

Table 1. Birds recorded at Shenton Bushland (SHB), Underwood Avenue Bushland (UAB), Hollywood Reserve (HR), Monash Avenue Bushland (MAB), a Nedlands garden (NG), Kings Park (KP) (Serventy 1937, and Recher 2004) and Bold Park (BP) (How and Dell 1989). BA = Birds Australia records * = breeding (Shenton Bushland, University Bushland, Hollywood Reserve and Nedlands garden only); ^ = Cousin *et al.* (2000); + = introduced; Shaded = species probably reliant on native bushland to maintain presence or breed in metro. area. E = previously present but now locally extinct; U = status unchanged; I = status increasing; D = status decreasing.

NON-PASSERINE SPECIES	SHB	UAB	HR	MAB	NG	KP		BP	
	1994–2005	1998–2001	2001–02	2001–02	1981–2005	Serventy 1928–37	Recher 1996–2002	How & Dell 1986–89	B.A. 1975–2004
Mountain Duck	✓	✓*							
Wood Duck	✓*				✓		✓	✓	✓
Black-shouldered Kite	✓	✓,					U		✓
Whistling Kite						✓	E		✓
Brown Goshawk	✓	✓	✓		✓	✓	U	✓	✓
Collared Sparrowhawk	✓	✓	✓		✓	✓	U	✓	✓
Little Eagle	✓	✓*				✓	U	✓	✓
Brown Falcon						✓			✓
Australian Hobby	✓	✓	✓		✓	✓	U	✓	✓
Australian Kestrel	✓					✓	U		✓
Stubble Quail						✓			
Painted Button-quail	✓*	✓					✓	✓	✓
Spotted Dove +	✓*	✓*	✓		✓*	✓	D	✓	✓
Laughing Dove +	✓*	✓*	✓		✓*	✓	U	✓	✓

Table 1 (cont.)

PASSERINE SPECIES	SHB 1994-2005	UAB 1998-2001	HR 1998-2001	MAB 1998-2001	NG 1981-2005	KP		BP	
						Serventy 1928-37	Recher 1996-2002	How & Dell 1986-89	B.A. 1975-2004
White-backed Swallow								✓	✓
Welcome Swallow	✓	✓	✓	✓	✓	✓	D	✓	✓
Tree Martin	✓	✓	✓	✓	✓	✓	D	✓	✓
Black-faced Cuckoo-shrike	✓	✓	✓*	✓	✓	✓	I	✓	✓
White-winged Triller						✓	U		
Rufous Whistler	✓	✓*	✓			✓	I	✓	✓
Golden Whistler						✓	E	✓	✓
Scarlet Robin						✓	E		✓
Yellow Robin						✓	E		✓
Grey Shrike-thrush								✓	✓
Willie Wagtail	✓	✓	✓		✓	✓	D	✓	✓
Grey Fantail	✓	✓*	✓		✓	✓	D	✓	✓
Western Flyeater	✓	✓*	✓			✓	D	✓	✓
Weebill	✓*	✓*	✓			✓	I	✓	✓
Yellow-rumped Thornbill	✓	✓*				✓	D	✓	✓
Broad-tailed Thornbill						✓	E	✓	✓
Western Thornbill						✓	E	✓	✓
Splendid Fairy-wren						✓			✓
Variagated Fairy-wren							✓		✓
White-winged Fairy-wren	✓				✓ ¹			✓	✓
White-browed Scrubwren								✓	✓

Park although this seems their most likely origin. White-cheeked and New Holland Honeyeaters are comparatively recent regular visitors to Shenton Bushland and the Nedlands garden. The single record of a Variegated Fairy-wren in the garden demonstrates the unexpected mobility of this species. This bird (a male in full breeding colour) was clearly on the move, only stopping momentarily when attracted with a bird caller.

The area that includes the bushlands that are the subject of this paper is part of the daily feeding range of a large population of Carnaby's Cockatoo. Over the last 26 years we have recorded flocks of up to 670 individuals roosting in summer and autumn in north Hollywood, close to the Hollywood Reserve (Berry 2008). Although their daily feeding range is not known, these bushlands must provide a significant proportion of the daily food requirements of what represents a very substantial avian biomass. The use of the 0.75 ha. Monash Avenue Bushland by Carnaby's Cockatoo, where it feeds on *Banksia* and *Allocasuarina*, demonstrates that even the smallest of bushlands contribute to a larger collective food resource and the persistence of this large, mobile species in the metropolitan area.

In conclusion, preservation of the biodiversity and composition of the bird assemblages currently present in Perth's western

suburbs, which includes Kings Park and Bold Park, two of the City's largest and most iconic nature reserves, is likely only to be maintained in the long term, if the existing remnant bushland between them is preserved. This should include not only Shenton and Underwood Bushlands, Hollywood Reserve and Monash Avenue Bushland, but native bushland and the existing native eucalypts on adjacent State (Health Department; Water Corporation), Commonwealth (Defence force) and private land (Bedbrook Place). There is probably still the opportunity to create a viable linkage of native vegetation between Kings Park and Bold Park

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